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1. (original) A process for producing a composite material, in which at least two materials with different refractive indices occur in a substantially periodic sequence along all three spatial directions, the structure of the composite material being produced using at least one structure-directing building block in the style of a template as a three-dimensional copy thereof.
2. (currently amended) The process as claimed in claim 1, ~~characterized in that~~ wherein the structure of the composite material is composed of three-dimensionally arranged, preferably substantially spherical particles.
3. (currently amended) The process as claimed in claim 1 ~~or claim 2, characterized in that~~ wherein the composite material includes two materials whereof the refractive index differs by at least two units from one another ( $\Delta n \geq 2$ ).
4. (currently amended) The process as claimed in ~~one of claims 1 to 3,~~ claim 1, comprising the following steps:
  - a) producing a primary template, which has a structure made up of three-dimensionally arranged, preferably substantially spherical particles with cavities (interstices) between these particles,
  - b) filling the cavities of the primary template with a curable material and curing the curable material,
  - c) removing the primary template in order to produce a structure which represents a three-dimensional negative of the structure of the primary template,
  - d) filling the cavities in the secondary template with at least one precursor of an inorganic oxide,

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- e) hydrolyzing the precursor and converting it into the inorganic oxide by means of a pressure and/or heat treatment,
  - f) removing the secondary template to produce a three-dimensional copy of the primary template composed of oxide particles.
5. (currently amended) The process as claimed in claim 4, ~~characterized in that~~ wherein the oxide particles of the structure which results from f) are substantially completely covered with a metal, in particular with Cu, Ag, Au, Pt or Pd, or an alloy of these metals.
6. (currently amended) The process as claimed in ~~claim 5,~~ ~~characterized in that~~ claim 4, wherein the cavities in the resulting structure are at least partially filled with the metal.
7. (currently amended) The process as claimed in ~~one of claims 4 to 6,~~ ~~characterized in that~~ claim 4, wherein the primary template is produced by a self-organization route.
8. (currently amended) The process as claimed in ~~one of claims 4 to 7,~~ ~~characterized in that~~ claim 4, wherein the primary template is a colloidal SiO<sub>2</sub> crystal template.
9. (currently amended) The process as claimed in ~~one of claims 4 to 8,~~ ~~characterized in that~~ claim 4, wherein the primary template is removed by chemical or physical dissolution, preferably using a basic solution, in particular using sodium hydroxide solution, or using an acidic solution, in particular using hydrofluoric acid.
10. (currently amended) The process as claimed in ~~one of claims 4 to 9,~~ ~~characterized in that~~ claim 4, wherein the curable

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material is a polymerizable compound or composition, in particular methyl methacrylate.

11. (currently amended) The process as claimed in ~~one of claims 4 to 10, characterized in that~~ claim 4, wherein the inorganic oxide is  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ ,  $\text{Fe}_2\text{O}_3$  or  $\text{TiO}_2$ .
12. (currently amended) The process as claimed in ~~one of claims 4 to 11, characterized in that~~ claim 4, wherein the precursor is preferably an alkoxide oligomer of a metal preferably selected from the group consisting of Al, Zr, Fe or Ti.
13. (currently amended) The process as claimed in ~~one of claims 4 to 12, characterized in that~~ claim 4, wherein the inorganic oxide is doped, preferably with Al, Ga, Gd, Sn and/or Ge.
14. (currently amended) The process as claimed in claim 13, ~~characterized in that~~ wherein the doped inorganic oxide is produced from a single-source precursor.
15. (currently amended) The process as claimed in ~~one of claims 4 to 14, characterized in that~~ claim 4, wherein the heat treatment in accordance with step e) is carried out at temperatures of  $< 250^\circ\text{C}$ , in particular between  $180^\circ\text{C}$  and  $250^\circ\text{C}$ .
16. (currently amended) The process as claimed in ~~one of claims 4 to 15, characterized in that~~ claim 4, wherein the pressure treatment in accordance with step e) is carried out at pressures of  $> 1$  bar, in particular between 2 bar and 50 bar.
17. (currently amended) The process as claimed in ~~one of claims 4 to 16, characterized in that~~ claim 4, wherein the

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secondary template is removed by chemical or physical dissolution, preferably by means of an organic solvent, in particular by means of acetone, ethyl acetate, tetrahydrofuran and/or dimethylformamide.

18. (currently amended) The process as claimed in ~~one of claims 5 to 17, characterized in that~~ claim 5, wherein the covering of the oxide particles with a metal is carried out by a wet-chemical route.
19. (currently amended) The process as claimed in ~~one of the preceding claims, characterized in that~~ claim 1, wherein the resulting particles of the structure of the composite material are core-shell particles.
20. (currently amended) The process as claimed in claim 19, ~~characterized in that~~ wherein the core of the core-shell particles substantially comprises  $\text{TiO}_2$  and the shell substantially comprises silver.
21. (currently amended) The process as claimed in ~~one of claims 2 to 20, characterized in that~~ claim 2, wherein the particles are nanoparticles with a particle size of  $< 500$  nm, preferably  $< 250$  nm.
22. (currently amended) A composite material, produced by the process as claimed in ~~one of the preceding claims.~~ claim 1.
23. (currently amended) A composite material, producible by the process as claimed in ~~one of claims 1 to 21.~~ claim 1.
24. (currently amended) The composite material as claimed in ~~one of claims 22 or 23, characterized in that~~ claim 22, wherein it has a structure of three-dimensionally arranged, substantially spherical particles, and at least two

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materials with different refractive indices occur in a periodic sequence along all three spatial directions.

25. (currently amended) The composite material as claimed in claim 24, ~~characterized in that~~ wherein the substantially spherical particles are what are known as core-shell particles.
26. (currently amended) The composite material as claimed in claim 25, ~~characterized in that~~ wherein the core is an inorganic oxide, preferably  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ , and/or  $\text{Fe}_2\text{O}_3$ .
27. (currently amended) The composite material as claimed in ~~claim 25 or claim 26, characterized in that~~ claim 25, wherein the shell is metallic, preferably form from Cu, Ag, Au, Pt or Pd or an alloy of these metals.
28. (currently amended) The composite material as claimed in ~~one of claims 25 to 27, characterized in that~~ claim 25, wherein the core of the core-shell particles substantially comprises  $\text{TiO}_2$  and the shell substantially comprises silver.
29. (currently amended) The composite material as claimed in ~~one of claims 25 to 28, characterized in that~~ claim 25, wherein the core is doped, preferably with Al, Ga, Gd, and/or Ge.
30. (currently amended) The composite material as claimed in ~~one of claims 24 to 29, characterized in that~~ claim 24, wherein it includes two materials whereof the refractive index differs by at least two units from one another ( $\Delta n \geq 2$ ).
31. (canceled)